BENCHMARKS

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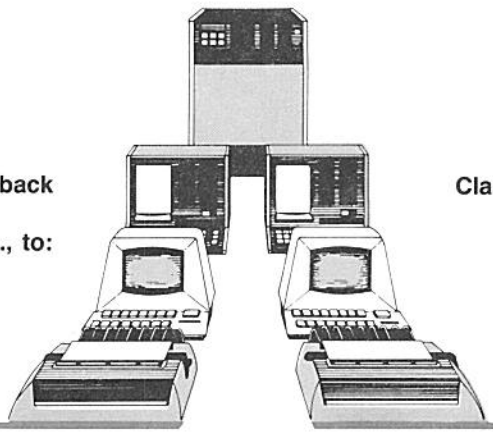

BENCHMARKS Reader/User feedback is encouraged.
Send all letters, suggestions, etc., to:
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Services Available to Users of the NTSU Computing Facilities

The NTSU Computing Center is located in the Information Sciences Building, Room 119. Telephone: (817) 565-2324. HELP DESK phone: 565-4050.

INFORMATION AND ID CODES - Carolyn Goodman

BENCHMARKS QUESTIONS/CONTRIBUTIONS, ETC. - Claudia Lynch

STATISTICAL/RESEARCH SUPPORT - George Morrow, Scott Barber, Claudia Lynch, Dave Molta, Panu Sittiwong

STUDENT PROGRAMMING PROBLEMS - CSCI Department, Room 542A, GAB
BCIS Department, Room 152, BA

JCL PROBLEMS - Help Desk

PRE-RESEARCH COUNSELING - George Morrow, Scott Barber, Dave Molta, Panu Sittiwong, Claudia Lynch

DATA ENTRY & KEYPUNCH - Betty Grise

TEST SCORING & ANALYSIS - Betty Grise

DISK SPACE PROBLEMS - Carolyn Goodman

PASSWORD AND OPERATING SYSTEM PROBLEMS - Help Desk

ADMINISTRATIVE APPLICATIONS - Coy Hoggard

COMMUNICATION/TERMINAL PROBLEMS - Help Desk

PRINTOUT RETRIEVAL - RJE Operators

Spring Computing Hours

Computing facilities will be open during the following hours throughout the Spring Semester (not applicable to holidays):

Computing Center RJE:	7 a.m. Monday - Midnight Saturday Sunday, Noon - Midnight
ISB 110 Terminal Area:	Monday - Thursday, 7:30 a.m. - Midnight Friday, 7:30 a.m. - 6 p.m. Saturday, 9:00 a.m. - 7 p.m. Sunday, 2 p.m. - 10 p.m.
College of Business:	Monday - Thursday, 8:15 - Midnight Friday, 8:15 - 8 p.m. Saturday, Sunday, 12:15 p.m. - Midnight
Room 550C, GAB:	Saturday, CLOSED Sunday, 2 p.m. - 11 p.m. Monday - Thursday, 8 a.m. - Midnight Friday, 8 a.m. - 8 p.m.

NEW POLICIES, PROCEDURES, AND OTHER IMPORTANT STUFF

Exceptions to Scheduled Hours for GAB 550C

Due to limited space, the entire schedule for GAB 550C could not be printed on the previous page. Following are some exceptions to the preceding reported hours:

Days	Dates	Status
Monday - Thursday	May 6-9	OPEN 8 a.m. - 10 p.m.
Friday	May 10	OPEN 8 a.m. - 5 p.m.

HP-2000 Backup Schedule No Longer a Feature

The backup schedule for the HP-2000 will no longer be printed on a regular basis in BENCHMARKS. This information is available to anyone who logs-on to the HP, since it is incorporated into the login message.

Upgrades: NAS/8040, Waterloo/SCRIPT

The NAS/8040 has been upgraded to 16 megabytes of main memory. It can now also officially be called an NAS/8043, in keeping with an IBM reclassification of their comparable machines.

The Version of Waterloo/SCRIPT you get when you // EXEC SCRIPT is now 84.1. This is now two versions away from the version currently running on MUSIC. A new HELP file has been created on MUSIC for this version of Waterloo/SCRIPT. Enter HELP WSCRIPT from *GO mode for more information. NOTE: Do not specify a REGION size in your JCL unless you get an error message stating that you need more memory.

CALLing All PCU's ... Maybe

Sometimes various ports on the network seem to "go away" (i.e. a call is placed to a particular port - 8060, for example - and the reply is: NO RESPONSE FROM UNIT(S)). This may be because it is necessary to remove broken equipment and send it back to the factory for repairs (there are other reasons for this message, but we won't go into them here).

Oftentimes, when this broken equipment is removed, there is no backup equipment available. The Computing Center simply does not have enough money to stockpile backup equipment to replace, on a one-for-one basis, all the equipment that can possibly be broken at any one time. Therefore, when it is necessary to send broken equipment out for repair, the people handling the equipment removal try to work it in such a way that the least number of people are affected at any one time. This might mean juggling equipment between users (academic and administrative) so that no group is completely cut off from the network.

The bottom line is, if you place a call to a port and you get "NO RESPONSE FROM UNIT(S)" as a reply, place a call to another port, ex. 8040. If you do this a number of times and keep getting the message "NO RESPONSE FROM UNIT(S)," call the Help Desk or the Computing Center and ask what port you should call to get on the system you are trying to access.

Control Characters and the LocaL Area Network

Control Characters (ASCII characters 0 - 31) should never be sent as a part of a file across the network. This means that you should absolutely, positively, never ever try to look at an object deck on MUSIC or in any other way ship an object deck over the network. Other possible culprits are various wordprocessing files (WORDSTAR, etc.). If it is really necessary to send such a file over the network, they should be sent as either plain ASCII files (using only printable characters), or use software such as KERMIT which takes out control characters. Contact Academic Computing Services for further help with this matter.

MAILNET Electronic Mail Available at NTSU

NTSU is now a member of MAILNET, a network of universities which provides the ability to exchange electronic mail messages between computer users at member sites. Other MAILNET sites include the University of Alberta, the University of British Columbia, Carnegie-Mellon, the University of Chicago, Dickinson College, the University of Durham (UK), Educom, Grinnel College, Harvard, Iowa State, University College of London, MIT, the University of Michigan, the University of Newcastle (UK), New Jersey Institute of Technology, Northwestern University,

Queens University, Rensselaer Polytechnic Institute, Simon Frazer University, USC, Stanford, the University of Stockholm, Union College, and the University of Wisconsin-Madison. The University of Colorado-Boulder, the American College in Paris, Vanderbilt University, the California State University System, the University of Ottawa, Virginia Commonwealth University, the University of Washington, and the U.S. Bureau of Mines Research Center-Pittsburgh will soon be members as well.

In addition to sending mail to member institutions, MAILNET also furnishes gateways to other electronic mail networks, including ARPANET, BITNET, CCNET, CSNET, JANET (UK), and MTS-NET. This means that NTSU now has electronic mail access to hundreds of universities and other institutions across the United States and around the world.

This electronic mail service should be especially useful in support of research. Faculty and graduate students can keep in touch with colleagues at other institutions easily and fairly inexpensively. MAILNET will also facilitate coauthoring research papers with those at distant institutions, since it is as easy to send a 20 page paper as a three sentence memo.

Naturally, anything with all these advantages is not free of charge. In fact, since NTSU must pay Educom, the sponsor of MAILNET, on a per-message basis, the Computing Center must charge real money for the use of this service. MAILNET users will receive bills for their messages, which must be paid from the funds in the accounts to which their id codes are attached. Short messages will typically run about $0.40, while for longer messages the sky is the limit. Fortunately, before MAILNET transmits a message, it estimates the charges and asks the sender for confirmation. If the message will be too expensive, the sender can cancel it.

MAILNET is a hub network: all the member sites are serviced by a central facility. This central facility is the MULTICS system at MIT, which calls up each site every night, collecting and delivering the day's mail over a standard telephone line and modem. The mail collected from NTSU is then re-routed to the destinations by MULTICS. If a gateway to another network is used, the mail is forwarded to the hub of that network, where it is then passed to the receiving site. The use of multiple gateways is possible. To reach a CSNET site, for instance, mail is sent from NTSU to MIT, then routed to ARPANET, where it is transferred to CSNET, and then to the receiving site.

All this re-routing means that mail can take several days to reach a recipient. In fact, transmission to non-MAILNET sites in the U.S. may not compare favorably to the Postal Service in speed. It is significantly faster than international mail service to sites in foreign countries, however. An additional advantage is that the mail is transferred from one file under the control of a computer operating system to another. If a mail file is formatted using RUNOFF, for example, the RUNOFF commands can be transferred along with the text. This can make editing of draft manuscripts by coauthors at different sites especially easy.

MAILNET can be accessed at NTSU on VAX System B only. Any file under the control of the VMS operating system can be transferred, including text, programs, or data. You must receive special authorization to use MAILNET, however, and its use is currently limited to faculty, staff, and graduate students. To apply for a MAILNET account, see Bob Brookshire in the Computing Center.

New Disk Mapping Facility

A new disk mapping facility is available for gathering information about your disk datasets. The following JCL is necessary to use this utility:

```
//JOBCARD <---------------------- A valid job card
//EXEC MAPDISK
//VOL1 DD UNIT=SYSDA,DISP=SHR,VOL=SER=diskvolume
//SYSIN DD *                                  <-
XXXX                                          The disk volume
                                              you want to look
                                              at
```

The XXXX in the line after the //SYSIN DD *, stands for the ID part of a dataset name, such as USER.IDID.DATA. Alternatively, if XXXX$ is specified in this line, the program will search the entire dataset name for any occurrence of whatever is in the string XXXX. If you do not put anything after the SYSIN DD * line, an error will occur. You may list as many DD lines as you wish, one for each disk volume you want to map.

Transferring Card Data to the 8040
By Scott Barber, Academic Computing Services

If you have a project which requires transferring data on IBM cards to your MUSIC account, you can run a job to do this without too much grief! In the past, you were required to punch several cards containing JCL (Job Control Language) statements which you would combine with your data cards for the transfer. Now, almost all of these cards have been punched for you and are kept in Room 110 in the Science and Technology Library.

The only card you need to punch yourself is the JOB card which identifies you to the system and sets some basic job parameters. The procedure to follow is fairly simple:

1. Go to Room 110 and ask for a set of cards to punch data to the MUSIC system.
2. Go to the card punch machine in the ISB building in the hall where printed output is retrieved.
3. Punch a JOB card to place on the top of your stack of cards. When you sit down at the machine, the power button will be at your right knee. Use the ‹REL› key to move cards through the machine. There should be two cards in place when you begin to type (only one card will actually be punched at a time). Use the ‹NUMERIC› key to punch numeric and "shifted" characters. Your JOB card must be just right for your job to work. Be sure to use your batch password on this card!
4. Place the JOB card on top, followed by all of the cards you received from 110 except the two cards with just %% and // on them. They will go below the cards containing your data.
5. Give the stack to the I/O operators to run your job.
6. After they have run the cards through the card reader, go to a terminal, sign-on to your account and type OSJR from the *GO mode. (The prompt in OSJR is ENTER REQUEST:)
7. You can check the status of your job by simply hitting the carriage return key ‹CR› at the prompt.
8. When your job has run (OUTPUT READY FOR MUSIC), type:

OUT J="###",D=PUN,FILE=filename
Job Number File name for new MUSIC file

9. The system will respond with "OUTPUT COPIED", and you may then enter END to exit OSJR and return to the *GO mode. Your data will be stored in the file you specified in the OUT command.

If you need help with the JCL or OSJR, consult the help desk staff in Room 110. If you need help with the card punch machine, talk with the receptionists in the Computing Center and they will refer you to someone who can help out.

Processing Tapes on the NAS/8040 Continued: Updating the TMC
By Claudia Lynch, BENCHMARKS Editor and Foreign Tape Liaison

The first part of this article, in last month's newsletter, stated that tape processing on the NAS/8040 is accomplished through a tape management system (TMS), which provides users with protection against inadvertent loss of tape data and manages the many tapes in the Computing Center's tape library. Furthermore, in order for the TMS to be effective, it must control all the tapes that are being processed. To accomplish this, people who own tapes that they want to access must have them copied onto a tape controlled by the TMS.

The tape management system keeps track of what is going on with its tapes through the tape management catalog (TMC). The TMC is updated each time a tape is mounted and dismounted, and contains the following information:

- Volume Serial
- Blocksize
- Tape Density
- Logical Record Length
- Record Format
- Expiration Date
- Dataset Name
- Jobname/Stepname Creating File

This article is concerned with the expiration date recorded in the TMC. The TMS allows users to specify retention periods and expiration dates for their tapes (expiration dates are calculated, if a retention period is specified). The default retention period is 180 days. Each file on a tape has an expiration date associated with it. If the tape is a copy of an outside (foreign) tape, all the datasets (files) on the tape will have the same expiration date. If the tape consists of files that have been added over time, each file will have a different expiration date. A TAPE WILL NOT EXPIRE, UNTIL ALL THE FILES ON IT HAVE EXPIRED!

While this may be a comforting thought for a few, do not be lulled into blissful abandon. Unless you are continually adding files to your tape, it will expire eventually, and then what will you do? An expired tape is AUTOMATI-

CALLY returned to scratch tape status, ready to be written over at a moments notice. To keep on top of things, occasionally (once every couple of months or so), run the following job:

```
//JOBCARD <----------A Vaild job card
// EXEC TMSINFO
//SYSIN DD *
VOL=tapevolume <----------Your TMS tape number
/*
```

This will inform you of the status of the various files on your tape(s). It should be noted that the expiration dates (EXPDT=) reported by this utility are specified as Julian Dates. The table at the end of this article should aid you in deciphering the expiration date(s) of your file(s).

Should the need arise, the TMC can be updated online or through batch by authorized personnel. If, for example, you wanted to change the expiration date of a tape, this could be accomplished by an update to the TMC. To request an update of the TMC, submit a TMS Update Form (available from the Computing Center, ISB 119) to a member of the Academic Computing staff. The staff member will assist you in completing the TMS Update Form and will make arrangements with the Computer Operations Tape Librarian to process the TMS update request. Run the TMSINFO Utility (shown above) three days after submission of the form to verify that the update has taken place.

For more information on the Tape Management System, consult the OPER help file on MUSIC. To read it, enter HELP OPER while logged-on to MUSIC and follow the instructions.

Perpetual Julian Date Calendar (Non Leap Year*)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	001	032	060	091	121	152	182	213	244	274	305	335
2	002	033	061	092	122	153	183	214	245	275	306	336
3	003	034	062	093	123	154	184	215	246	276	307	337
4	004	035	063	094	124	155	185	216	247	277	308	338
5	005	036	064	095	125	156	186	217	248	278	309	339
6	006	037	065	096	126	157	187	218	249	279	310	340
7	007	038	066	097	127	158	188	219	250	280	311	341
8	008	039	067	098	128	159	189	220	251	281	312	342
9	009	040	068	099	129	160	190	221	252	282	313	343
10	010	041	069	100	130	161	191	222	253	283	324	344
11	011	042	070	101	131	162	192	223	254	284	325	345
12	012	043	071	102	132	162	193	224	255	285	326	346
13	013	044	072	103	133	163	194	225	256	286	327	347
14	014	045	073	104	134	164	195	226	257	287	328	348
15	015	046	074	105	135	165	196	227	258	288	329	349
16	026	047	075	106	136	166	197	228	259	289	330	350
17	017	048	076	107	137	167	198	229	260	290	331	351
18	018	049	077	108	138	168	199	230	260	291	332	352
19	019	050	078	109	139	169	200	231	261	292	333	353
20	020	051	079	110	140	170	201	232	262	293	334	354
21	021	052	080	111	141	171	202	233	263	294	335	355
22	022	053	081	112	142	172	203	234	264	295	336	356
23	023	054	082	113	143	173	204	235	265	296	337	357
24	024	055	083	114	144	174	205	236	266	297	338	358
25	025	056	084	115	145	175	206	237	267	298	339	359
26	026	057	085	116	146	176	207	238	268	299	340	360
27	027	058	086	117	147	177	208	239	269	300	341	361
28	028	059	087	118	148	178	209	240	270	301	342	362
29	029		088	119	149	179	210	241	271	302	343	363
30	030		089	120	150	180	211	242	272	303	344	364
31	031		090		151		212	243		304		365

*For leap years (1988, 1992, 1996, etc.) add a day on February - 060 - thus incrementing all the following dates by one.

Survey Update
By Scott Barber, Academic Computing Services

The survey which has been referred to in recent articles of BENCHMARKS was distributed last month to holders of individual IDs and classroom IDs on the 8040 and VAX systems on campus. From the completed forms, many different perceptions about the services provided here have been expressed.

Feelings and opinions about documentation, consulting services, technical issues, and more are giving us valuable information which we can use to plan improvements in the computing facilities and services here. Also, priorities in some areas may be affected by the level and type of response on particular issues.

So far, there are many questionnaires which have not been completed and returned, and the ability to generalize to all mainframe users is limited. Therefore, if you have received a questionnaire and not yet returned it, or have questionnaires to distribute to your classes and have not yet done so, I urge you to take care of this quickly.

Also, if you have are a graduate student or faculty member with an ID on the 8040 or the VAX systems and have not received a questionnaire, please contact me at 2324 to request that one be sent to you. Your answers will be examined carefully, and services will most certainly be affected by these responses.

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*                                     *
*          OPERATIONS                 *
*                                     *
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Backup Schedule for OS/MVS

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems and their contents is done once every two weeks at some low activity period over a weekend.

NAS/8040 Performance Statistics for March

SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
VM/SP3	744	6.89	737.11	1.80	735.31	99.8%
MUSIC	744	31.05	712.95	6.41	706.54	99.1%
MVS/JES2	744	7.50	736.50	6.34	730.16	99.1%
COMPLETEA	744	7.50	736.29	8.24	728.05	98.9%

The AS/8040 CPU achieved 99.1% uptime. The AS/7360 DASD achieved 100% uptime.
System Uptime = (Production Hrs Achieved)/(Planned Production Hrs)
Production Hrs Achieved = (Planned Production)-(Unplanned Maint.)
Scheduled Operating Hrs = (Planned Maint.) + (Planned Production)
MUSIC Planned Maintenance Hours include 23.70 hrs system backup.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

CPU, Tape, and Disk Subsystems (NAS)	
1. Field Change Order Installation on CPU	6.88 HOURS
Terminal Control System (IBM)	
1. 3272 Terminal Controller Failures	2.00 HOURS
Terminal Control System (MEMOREX)	
1. 1270 TCU Asynch Line Failures	1.00 HOURS
Miscellaneous	
1. Undetermined Causes for Systems Restarts	5.17 HOURS
2. MVS/JES2 System Tuning/Improvements	0.45
3. VM/SP3 System Tuning/Improvements	1.18
4. Installed Updated Version of CMS	0.83
TOTAL	7.63 HOURS
GRAND TOTAL	17.51 HOURS

TECHNICAL SUPPORT

Program Hit Parade

The following programs were used the most frequently during the month of March.

TOP TEN PROGRAMS IN TERMS OF FREQUENCY OF RUNS

Program	Description	Number of Runs
1. IEWL	Linkage Editor	18740
2. PGM=*.DD	Compiled Program	17554
3. IKFCBL00	VS COBOL Compiler	14189
4. IFOX00	System Assembler	9981
5. IEBGENER	IBM Utility	8644
6. SCRIPT	Waterloo SCRIPT	6545
7. PTPCH	Dataset Lister	5611
8. SASLPA	SAS	5588
9. IEFBR14	IBM Null Utility	3896
10. LOADER	System Loader	2215

TOP TEN PROGRAMS IN TERMS OF CPU SECONDS USED

Program	Description	CPU Seconds
1. PGM=*.DD	Compiled Program	92748
2. SASLPA	SAS	76370
3. IFOX00	System Assembler	31350
4. IKFCBL00	VS COBOL Compiler	21119
5. SCRIPT	Waterloo/SCRIPT	12835
6. PTPCH	Dataset Lister	10281
7. LOADER	System Loader	8021
8. SPSS	SPSS-X	7795
9. IEWL	Linkage Editor	7537
10. BATCH204	Batch Database	3608

New Member of the Technical Support Team Arrives

Gordon Murphy became the newest member of Technical Support in March, when he took over the position vacated by Dan Hood. Gordon comes to us from AMDAHL Corp., where his main duties were MVS performance and tuning, capacity forecasting, and MVS debugging. He can be looking forward to more of the same here at NTSU.

Gordon says he got into computing through his interest in electronic music (he has a B.M. in Piano from the University of Kentucky). He wrote a computer program for a music project, and the rest is history ...

COMMUNICATIONS

Dialing Up NTSU Computers Over the Telephone

Phone numbers for the local area network are:

300/1200 BAUD:	(817) 565 - 3300 3499
300 BAUD:	D/FW METRO 429 - 6006

The numbers that will accept either 300 or 1200 baud communications have an autobaud feature that requires the user to hit the ‹RETURN› key repeatedly until the receiving modem can determine the appropriate baud rate. The METRO telephone number is for 300 baud communications only. After a communications link has been successfully established, the user will receive the # prompt. At this point, it will be necessary to issue the appropriate CALL command to connect with a computer.

CALL 8040 will connect with the 8040
8050 (on which you can access MUSIC)
8060

CALL 8300 will connect with the 8040 at 300 baud

CALL 3270 will connect with the 8040 through the 3270
3280 protocol converter

CALL A780 will connect with VAX system A

CALL B780 will connect with VAX system B

CALL 2000 will connect with the HP-2000 computer

```
* * * * * * * * * * *
*                   *
*      M U S I C    *
*                   *
* * * * * * * * * * *
```

MUSIC Backup Hours

A message will be sent to all users signed on to MUSIC approximately 10 minutes before backups are begun. It will be in the form * * MUSIC SHUT DOWN AT xxxx AM - SCHEDULED BACKUP **. To find out the backup hours while signed on to MUSIC, enter HELP HOURS. The following backup schedule is currently in effect:

Tuesday	3 a.m. (for about 3 hours)	Weekly backup
Wednesday - Saturday	4 a.m. (for about 2 hours)	Daily backup
Saturday	Midnight (for about 2 hours)	Daily backup

```
* * * * * * * * * * *
*                   *
*      V A X E N    *
*                   *
* * * * * * * * * * *
```

Revised VAX Backup Schedule

Incremental backups of both VAX systems are performed Monday through Thursday at 4 p.m. Users do not have to log out, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday beginning at 8 a.m. These generally will take all day to complete. Again, users do not have to log out, but any files that are open will not be backed up.

A "Stand Alone" backup of the system disk is done the third Tuesday of every month, in the afternoon just before Preventive maintenance. This procedure makes a copy of the system disk that can be used to restore its contents if the disk is completely destroyed. The system will be shut down, watch the system login for specific times and dates.

NOTE: No backups are taken on the weekends. Requests for restoration of files should be made via MAIL to the username OPERATOR. Your file can only be restored if it existed before the last backup was done.

VAX System Manager Resigns

Kim Stickney, the VAX System Manager since shortly after we acquired the VAX computers, resigned his position in March. He returned to his previous job at DEC in Massachusetts, where he also owns a home. We tried to get him to stay, but alas, he was firmly committed to the move. We expect to hire a new system manager for the VAXEN sometime this month.

Transferring files from VAXLand to MUSIC
By Lee Harper, VAX Operator

There is a new utility on the VAX A and B called TRANSFER that lets any VAX user transfer a file to MUSIC on the 8040. You will need a valid MVS batch userID and password, and a MUSIC ID to send your file to. The MVS password that is asked for is not your MUSIC password, it is the one controlled by the MVS batch system on the 8040. You can send a file to any MUSIC ID (it doesn't have to be yours). Here's how:

1. Log on to one of the Vax machines and type 'TRANSFER'. This will run a utility that will prompt you for further information.
2. Answer the prompts for filename, MVS userid, MVS password, and MUSIC ID. If you wish to take the default that is listed, simply press RETURN. A sample run on the VAX looks like this (examples of what you might type are underlined):

$TRANSFER

Enter filename or press RETURN for help: MYFILE.TXT

MVS UserId —default: XX99‹: AA11

MVS Password: ____ ‹--your password will not print on the screen

Transfer to what Music ID —default: AA11‹: BB22

TEL -- BATCH DATASET = #MYFILE.TXT -- OK
TEL -- JOB SUCCESSFULLY QUEUED -- TELPRO IS * ACTIVE # 42
MYFILE.TXT queued for transfer to MUSIC ID BB
$

A job is now submitted to the 8040 via the HASP+ link. This job will be routed to MUSIC can be found through OSJR.

3. Sign on to MUSIC and type OSJR. When the output is ready for MUSIC, the file that you transferred can be put into a MUSIC save library file by typing:

   OUT D=PUN,FILE=filename ‹--new MUSIC file containing your output

   Exit OSJR by typing 'END' and then LIST the new file to check for correct transmission. Some characters will not be translated correctly, since to go from the VAX to MUSIC, data are translated from ASCII to EBCDIC format.

If you have further questions, they may be directed to the VAX operators at 565-4161.

```
* * * * * * * * * * * * * * * * * * * * *
*                                       *
*        I N F O R M A T I O N          *
*            S Y S T E M S              *
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NAS/6650 Performance Statistics for March

SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
MVS/JES2	744	0.00	744.00	14.22	729.78	98.1%
COMPLETEA	255	0.00	255.00	3.63	251.37	98.6%
ADABASA	744	19.84	724.60	15.55	708.61	97.9%

The AS/6650 CPU and the AS/7360 DASD achieved 100% uptime. ADABASA'S planned maintenance hours includes 19.84 hours for system backup maintenance. Please consult the NAS/8040 Performance Summary for an explanation of cell entries. It can be found under the OPERATIONS section of this newsletter.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

DASD Subsystems (STC)	
1. 8650 DASD Corrective Maintenance	3.15 HOURS
2. 8650 DASD Failures	3.80
TOTAL	6.95 HOURS
Terminal Control System (COMTEN)	
1. 3690 Terminal Controller Failure	5.63 HOURS
Terminal Control System (IBM)	
1. 3272 Terminal Failures	0.86 HOURS
Miscellaneous	
1. Undetermined Causes for System Restarts	1.02 HOURS
2. MVS/JES2 System Tuning/Improvements	1.17
3. COMPLETA Program Tuning/Improvements	0.26
TOTAL	2.45 HOURS
GRAND TOTAL	15.89 HOURS

A New Face in Information Systems

Kay Teer, formerly a programmer at Moore Business Systems, began working here in the Computing Center last month. Her job assignment is with Fiscal Systems, where she is filling the vacancy left by Ellen Weissmann's resignation last year. Kay is pursuing a B.S. in Computer Science, and is joined as an employee of NTSU by her mother, Yvonne Jenkins, who works in the Advancement Center.

The Killion*
By Ian Frazier

At a little after noon on Friday, August 6th, Marcie Chang, anchorwoman on TV 8's "Newsbusters" evening news show picked up her envelope at the pay window on the studio's fifth floor, bought a ham-salad sandwich and a cup of coffee from the lunch wagon in the hall, and took the elevator back to her office on the tenth floor. Sitting down at her desk, she tore open the envelope, which contained the first payment of the lucrative new contract that the station had offered her in the sprint. She took one look at the check and collapsed. She was dead before her face hit the desk top. A few minutes later, TV reporter Kerri Corcoran, a colleague and friend, came into Marcie's office, saw her, looked at the check she still held in her hand, and crumpled, lifeless, to the floor. The same fate met the receptionist who came to Marcie's office to find out why she wasn't answering her phone, and the building security guard, who was summoned by the cleaning woman after she had noticed the pile of bodies.

Nor was that the end. In quick succession, three police officers, a fireman, a newspaper reporter, and a pathologist from Mount Siani were added to the death list. Alarmed public-health officials called on the Institute for Catastrophe Control, in Princeton. With grim predictabilitly, two of the institute's top scientists soon showed the seriousness of the challenge when they, too, were felled. Within forty-eight hours, scientists from the institute who had taken over the case were fairly certain that the fatal agent was the check that Marcie had picked up that Wednesday afternoon. They examined it through heavily tinted safety glasses, in sections,with no one scientist viewing the entire check. Within another forty-eight hours, Dr. Leo Wiedenthal, director of the institute, knew what he had on his hands. In a statement released to the press, he said that there was no evidence of a supertoxin or highly contagious disease on the fatal paycheck. Rather, hew said, "Marcie Chang and the eleven other victims almost certainly died as a result of what they saw on the check. Through a computer error, Marcie's check was made out to an extremely high number. Apparently, the computer made Marcie's check out to the sum of one killion dollars. The killion, as every mathematician knows, is a number so big that it kills you."

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Since the days of Archimedes, man has known that numbers could attain great size. The Greeks could count up to a million, and the Romans, in their turn, made it to a billion and a trillion. Then man had to wait almost fifteen centuries, until the gilded arms of the Renaissance had flung open the shutters of the Dark Ages, before he could move on to a billion trillion, a million billion trillion, and, finally, a zillion. In 1702, Sir Isaac Newton, father of the theory of universal gravitation, experimented with numbers as high as a million billion trillion zillion, at one point even getting up to a bazillion. These experiments convinced him of the theoretical possibility of the killion. He stopped his experiments abruptly when, as the numbers approached one killion, he found himself becoming very sick. The German mathematician Karl Friedrich Gauss, hearing about Newton's discovery from someone he met at a party, was so upset by the thought of a killion that he made up his own numbers, called Gaussian numbers. These were numbers that could get big, but not that big. Unfortunately, Gauss's brave attempt to develop a risk-free numerical system wound up on the scrap heap of failed theories. In the early twentieth century, Albert Einstein made some calculations that brought him right to the very threshold of the killion. But here even Einstein halted. Probably the smartest scientist who ever lived, Einstein also had a great, abiding affection for life. After the invention of the computer, it was Einstein who insisted that each one be equipped with a governor that would shut it off automatically if it ever approached a killion. Were it not for Einstein's farsightedness, the dawn of the computer age might have had frightening consequences for mankind.

So what went wrong in the affair of Marcie Chang's deadly paycheck? Why did the network computer, running a routine payroll program, make an error that no computer had ever made before? To understand this question, it is important to understand how a computer works. People unfamiliar with computers sometimes find it helpful to think of them as fairly goodsized, complicated things. Computers range in size from as small as a motel ice bucket to as large as an entertainment complex like New Jersey's Meadowlands, including the parking lot. Inside, a computer will have a short red wire hooked to a terminal at one end and to another terminal at the other end. Then there will be a blue wire also hooked to terminals at either end, and then a green wire, and then a yellow wire, then a orange wire, then a pink wire, and so on.

This particular computer was so big that when expert atter with it, they soon had more wires, terminals, and other parts lying around than they knew what to do with. The technicians spread the parts all over the floor of an unused equipment shed, and finally they found one that they identified as the governor — the little safety device that could trace its lineage back to Einstein's terrifying vision on that rainy February afternoon in Munich so many years ago. When they examined it closely, they discovered the problem. It was completely covered with gray stuff, kind of similar to the gray stuff that collects on rotary hot-dog grills. There was so much gray stuff that the little armature that was supposed to fit into a V-shaped groove on this other armature couldn't fit in at all. No one knew where the gray stuff could have come from, so there was nowhere to fix the blame. That did not change the fact that a small amount of gray stuff you could blow from your palm with one light breath had cost twelve lives.

In the aftermath of the tragedy, many people asked, "How can such tragedies be prevented in the future?" Well, you could give your paycheck to the bank teller every week without looking at it—taking such risks is what bank tellers are paid for. But then you would never know how much money you had. You could move to a country where people have never heard of computers. But that might be awfully far away, and it might be years before you felt comfortable there. You could vacuum computers at least three times a week to remove any foreign matter. But, on the other hand, what if it didn't work?

One hard, indisputable truth remains: There is nothing anybody can do about the killion. It is not a person, or a product, or an institution, and so need answer to no one. It will always be out there, in the far range of mathematics, where space bends and parallel lines converge, and I don't know what all. In the end, the best you can really do is hope that if the killion gets anyone, the person it gets won't be you.

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